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ORVILLE A. DERBY

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Orville Adelbert Derby, for many years one of the associate editors of this *Journal*, was born at Kelloggsville, New York, on July 23, 1851, and died by his own hand at Rio de Janeiro, Brazil, on November 27, 1915.

After graduating at the high school, Derby entered Cornell University in 1869, taking what was then called the scientific course. While he was yet a Freshman, however, he became so interested in geology and was such a promising student that he was selected by Professor Charles Fred Hartt, then professor of geology at Cornell, to accompany him on a trip to Brazil in the summer of 1870. That was the first trip made to Brazil by Derby; it determined both his career and the whole course of his life. On his first voyage he visited Pernambuco, and made the first considerable collection of fossils ever made at Maria Farinha, a locality that has since been looked upon with especial interest by students of the Mesozoic history of South America.

In the summer of 1871 he went to Brazil with Hartt again, this time visiting the Amazon valley and making an important collection of Carboniferous fossils from the limestones at Itaitúba on the lower Tapajos River.

In 1873 he graduated from Cornell University with the degree of Bachelor of Science, and the year following he continued his geological studies for the Master's degree, which he received in June, 1874. His thesis was "On the Carboniferous Brachiopoda of Itaitúba, Rio Tapajos," and was published as No. 2 of Vol. I of the *Bulletin of Cornell University*, Ithaca, 1874. That was Derby's first publication on the geology of Brazil, and it is not only a valuable paper in itself, but it is especially interesting in view of subsequent developments. The Itaitúba fossils were in compact limestone, but as they were silicified they could be obtained in satisfactory form only by dissolving away the surrounding rock—a long and tedious process which would have thoroughly discouraged most young men of Derby's age. The spires of many of the specimens of these brachiopods have seldom been surpassed for delicacy and perfection.

The art of illustration was far from being so well developed in those days as it is now, and we thought ourselves very fortunate in being able to make and use the crude photographs with which that paper was illustrated.

In 1873 Derby was appointed instructor in geology at Cornell, and in the summer of 1874 Professor Hartt made arrangements to go to Brazil again. Leave of absence was obtained, Derby was placed in charge of the work of instruction in the department, and in September, 1874, Hartt went to Brazil again, taking Branner with him as his only assistant and going by way of Europe. It is often said that Hartt went to Rio on the invitation of the Brazilian government or of the Emperor D. Pedro II. As a matter of fact he went entirely on his own responsibility and without invitation from anyone, but with the idea of inducing the Brazilian government to establish a geological survey under his direction.

Arriving in Rio de Janeiro, he at once devoted all his energies to interesting the leading men in a geological survey of the empire, and by the end of the year the survey was authorized and provided for, and O. A. Derby, Richard Rathbun, and E. F. Pacheco Jordão were named as assistants of the new "Comissão Geologica do Imperio do Brasil." In December, 1875, Derby reached Rio de Janeiro and began his work under the government. He held this

position less than two years, for through a change of ministry the survey was abolished in 1877, and Hartt died in Rio that same year. Shortly after the suspension of the survey, however, Derby was given a position in the National Museum at Rio as curator in charge of geology, a position which enabled him to continue his studies on the geology of Brazil, and, to a certain extent, to preserve the results of the work of the extinct survey. He remained in the museum until 1886 when he was made state geologist of the Brazilian state of São Paulo.

The establishment of the São Paulo survey was a step of great importance to geological science in Brazil, for Derby's knowledge of and interest in the geology of the country as a whole enabled him to grasp more firmly the geological problems of that particular state, and at the same time he became and remained, up to the time of his death, the leading authority on the geology of Brazil. He was state geologist of São Paulo until 1904, when he resigned.

In 1907 a new federal geological service was provided for, and Derby was made its chief, a position he held during the rest of his life.

The first edition of Branner's *Geologia Elementar*, a work prepared especially for Brazilian students of geology, was thus dedicated: "To Orville A. Derby, who has devoted his life to the study of the geology of Brazil, and has done more than anyone else to solve its many problems, this work is affectionately dedicated." This is a brief and mild statement of Derby's great services to Brazil and to the science of geology, without mentioning his many other services to science and to that country.

First and last Derby was a paleontologist. He had no fondness for administrative work; he was but little interested in structural geology or in its methods; he was forced by circumstances into some acquaintance with microscopic petrography; but his interest in paleontology was genuine, deep, and all-comprehensive. From all the cares of office and the worries of life he found relief and happiness in boxes of poorly preserved fossils that most paleontologists would have put away as not worth while.

It was chiefly to this interest of his in paleontology that we owe Dr. C. A. White's *Contributions to the Paleontology of Brazil*,

published at Rio in 1887; John M. Clarke's *Trilobites of the Ercreí and Maecuru Sandstones*, Rio, 1896; *Upper Silurian Fauna of Rio Trombetas*, Rio, 1899; *Devonian Mollusks of the State of Pará*, Rio, 1899; and *Devonian Fossils of Paraná*, Rio, 1913. Besides these excellent works there are many smaller papers on paleontology that cannot be mentioned here, and there still remains unpublished an important volume by D. S. Jordan on the Cretaceous fossil fishes of Ceará.

During the last eight years Derby gave much of his time to the study of *Psaronius* and its relationships. The last of his published papers was on the stem structure of *Tietea singularis*, and appeared in the *American Journal of Science* for March, 1915, pp. 251-60.

Because he had to undertake work in regions but poorly supplied with maps, one of his first and most important duties, when he became state geologist of São Paulo, was the inauguration of topographic work. This work was intrusted to Horace E. Williams, an able and energetic young American to whom the state of São Paulo and the scientific world are indebted for an excellent series of topographic maps on a scale of one to 100,000, to say nothing of his explorations of the western portions of São Paulo, his work on the Serra da Canastra, etc.

Derby's own list of publications on the geology of Brazil numbers 125 papers. Naturally they embrace a wide range of subjects. Ten of his papers relate to the geology and genesis of the Brazilian diamonds. One of these, on the geology of the diamond and carbonado region of the state of Bahia, was the first publication to give an idea of the geology of that little-known district.

He became interested in the early cartography of Brazil, and published a number of papers on that subject.

As an author and as a scientific reasoner he was an extremely cautious man, so much so that the word "hedge" was constantly on his lips both for his own guidance and as a warning to his assistants.

The last evening I spent in his rooms at Rio de Janeiro he referred to this personal trait, and remarked that it had prevented his marrying—that he was too cautious to take the risk. This cautiousness of his was probably the real reason for some of the

long delays in publishing his results, delays which led to the tying up of his own results and those of his assistants. Without doubt he hoped that the delays would enable him to put everything beyond question and to make his reports final and complete instead of preliminary and tentative. But the delays were prolonged from year to year until his assistants became discouraged and the government more or less exasperated at the lack of practical results for such great and long-continued expenditures. It was probably this long delay that finally led to his resignation as state geologist of São Paulo.

Derby never felt obliged to show results. After he had been state geologist of São Paulo for ten or twelve years, and had published next to nothing on the geology of that state, I asked him point blank, and with some feeling, where his results were. He replied: "They are in my head." We had to change the subject. But the important fact behind his delays is that the geology of São Paulo is difficult and involves problems that he had not been able to settle to his own satisfaction, and he was unwilling to commit himself definitely to paper and thus lay himself open to adverse criticism.

It seemed unfortunate for Brazil, for himself, and for the cause of science that he was unable to bring himself to take an active interest in the economic geology of the country. But his first and only interest in geology was in geology as a pure science. To him a fossil was a thing of beauty, of interest and value, and a joy forever, but a mine or an industry was, after all, only an industry whose main object was money-getting.

Derby was a man of unlimited grit. When once he decided upon a course of action nothing turned him to the right or to the left. His whole life is a demonstration of his power to make good in spite of obstacles that would have been insurmountable for most men—his determination to be the leading authority on the geology of Brazil, cost what it might.

How many of us would have lived for forty years, in a foreign country, cut off, as he was, from all personal contact with the geologists of the world at large and from the people of his own race and from his own family? And yet, from the time he went to Rio

in 1875 to the day of his death he visited the United States only twice. One of these visits was in 1883 when he spent three months at Washington; the other was in 1890 when he attended the meeting of the American Association for the Advancement of Science at Indianapolis.

When the Comissão Geologica was abolished in 1877 the rest of us took to our heels. Not so Derby; he was not to be stampeded by a simple lack of funds or of employment; he meant to save the results of the work of Hartt and of his colleagues, and, in so far as it could be done, he did it.

Personally Derby was one of the kindest-hearted and most affectionate men I have ever known. His last dollar was at the service of his friends, and his right hand knew nothing of the kind deeds done by his left. The beggars in the streets found him their easiest victim.

He was held in the highest esteem in the community in which he lived. He stood for uprightness and honorable dealing, and he was never the willing tool of designing adventurers. For many years he has been justly regarded as the leading geologist in South America, and his standing is due, not to the fact that there are but few first-class geologists in South America, but to his ability and to his excellent work.

In 1892 he was awarded the Wollaston prize of the Geological Society of London, while his distinguished services led to his being made one of the associate editors of the *Journal of Geology* and to his election to membership in various learned societies in different parts of the world. He was a frequent contributor to the *American Journal of Science* and to this *Journal*.

A list of his papers on the geology of Brazil up to 1909 is given in the *Bulletin of the Geological Society of America*, XX, pp. 36-42. To that list should be added thirteen additional titles of papers that have appeared since its publication.